CHINESE STUDENTS' COMPONENT SKILLS OF PROBLEM SOLVING: A PILOT STUDY

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Problem solving has been considered as one of the most important cognitive skills for successful learning in the 21st century. According to previous studies, there are several factors that may impact people's problem solving achievement, such as inductive reasoning (Molnár, Greiff & Csapó, 2013), working memory (Wüstenberg, Greiff & Funke, 2012), creativity (OECD, 2014) or some personal factors like demographic characteristics (OECD, 2014), motivation (Frensch & Funke, 1995), learning strategies and ICT literacy (Greiff et al., 2014). The aim of this study is to define background factors which impact the developmental level of student's problem solving skills in China. A pilot test has been conducted in order to (1) explore the applicability of online assessments in China, (2) test the reliability of every cognitive test involved in the project, and (3) achieve a preliminary conclusion to verify the theoretical study and make guidance for further study. The pilot test was implemented in China in June 2016. The participants were sixth graders (N=50, age M=12.28, SD=.50). The tests were delivered by the eDia platform (Molnár, 2015). Test completion was divided into two sessions, each lasting approximately 45 minutes. In session 1, students worked on the inductive reasoning (IR), working memory (WM) and creativity tests. In session 2, students had to complete the problem solving (PS) test and a background questionnaire on demographical data, learning strategies, motivation and ICT usage. All the items were presented in simplified Chinese. The internal consistencies of the tests were good (Cronbach`s alpha: PS:.74; IR:.75; WM:.85; Creativity:.90), which confirmed the applicability of online testing in China. Participants' performance in PS had positive correlations with their performance in IR ($r=.440$; $p<.01$) and WM ($r=.522$; $p<.001$), but there was no significant correlation between PS and creativity. Students' PS achievement also showed a strong correlation with their test-taking motivation ($r=.575$, $p<.001$) and a moderate but significant correlation with ICT usage ($r=.308$, $p<.05$). Participants' gender and family background didn't influence their PS performance. The results indicate that students' learning strategies strongly impact their thinking skills development. Students who preferred memorization strategies had significantly lower performance in the IR test than others ($t=-3.141$, $p<.01$); and students who preferred control strategies showed significantly better performance in PS ($t=2.402$, $p<.05$), IR ($t=2.838$, $p<.01$) and creativity ($t=2.197$, $p<.05$) than their peers. Findings support the views that computer-based testing is applicable and the cognitive skills tests in the pilot test are reliable to measure students' component skills of problem solving in China at the age of 11-13. Moreover, the results supported the theoretical statement about one's problem solving achievement being influenced by specific thinking skills and background factors.

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